

1 9 8 7 - 2 0 1 7

CIMNE^R

EXCELLENT SCIENCE WITH AND FOR ALL:
THE CASE OF CIMNE

Cecilia Soriano

PhD Physics

Research Manager

Coordinator of the UNESCO Chair in Numerical Methods in Engineering



Organització de les Nacions
Unides per a la Educació



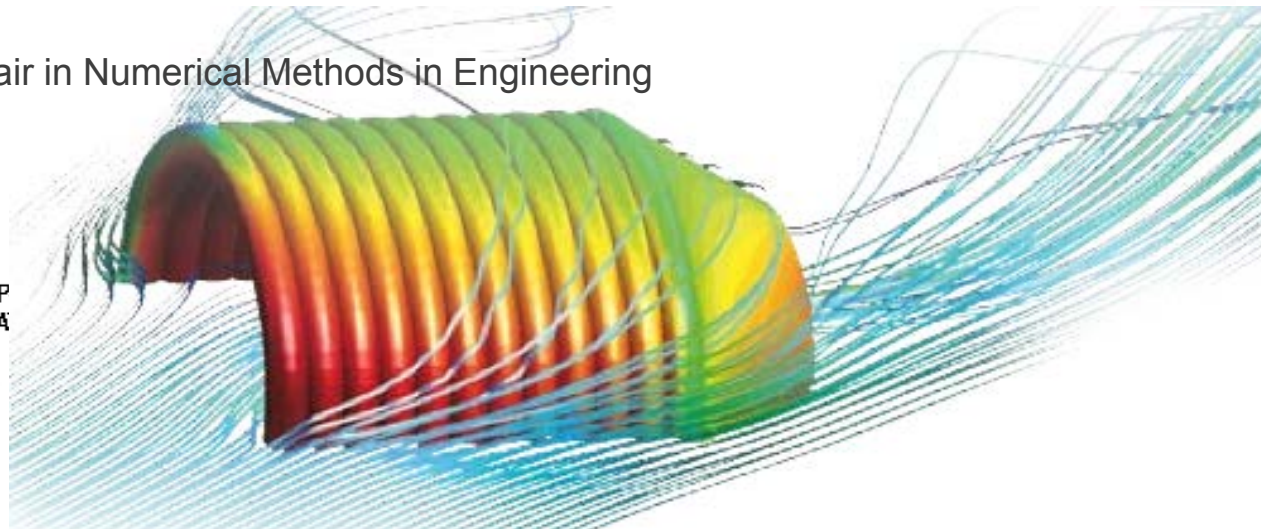
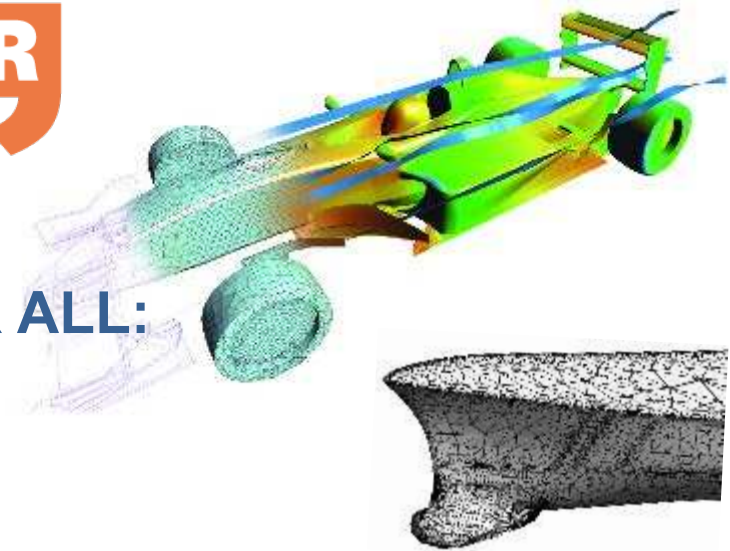
Universitat P
BARCELONA

Càtedra UNESCO de Mètodes
Numèrics en Enginyeria



PROGRAMA SOBRE CIENCIA ABIERTA Y GESTIÓN DE DATOS DE INVESTIGACIÓN

Barcelona, Spain, 3th July 2018



International Center for Numerical Methods in Engineering

CIMNE[®]

1987-2017
SCIPEDIA

Register for free at <https://www.scipedia.com> to download the version without the watermark

**generating
knowledge and solutions**

OUTLINE

- **CIMNE**

SCIPEDIA

- WE ARE COMPUTATIONAL ENGINEERING / MECHANICS

- Where can I meet my colleagues?

- Where can I publish my research?

Register for free at <https://www.scipedia.com> to download the version without the watermark

- How can we make our discipline strong?

- How our codes / solvers can have a higher impact?



- How can we make all our knowledge available to the world?



- **OUR OPEN SCIENCE PLATFORM**

SCIPEDIA

CIMNE^R

Public R+D center in computational mechanics
created in 1987, with a strong focus on research,
knowledge transfer, dissemination and
application of numerical methods in engineering.



SCIPEDIA

Register for free at <https://www.scipedia.com> to download the version without the watermark

A Consortium of:



Generalitat
de Catalunya



UNIVERSITAT POLITÈCNICA
DE CATALUNYA
BARCELONATECH

In cooperation with:



OUR MISSION

Research

Education

Dissemination

Technology Transfer

IN THE FIELD OF COMPUTATIONAL ENGINEERING

SCIPEDIA

Register for free at <https://www.scipedia.com> to download the version without the watermark

structures

fluids

particles

Thermal

civil

mechanics

naval

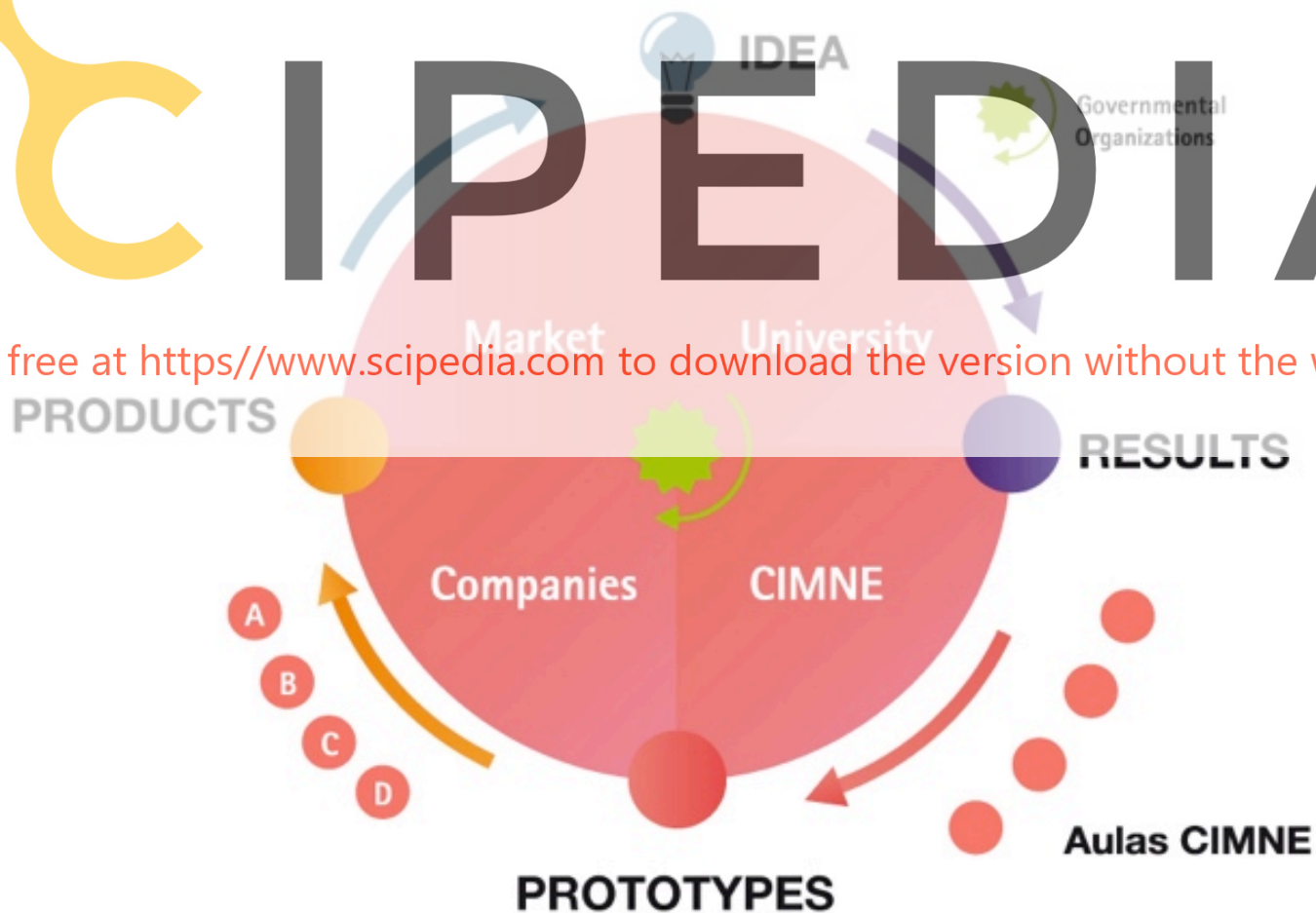
aero

FROM THE IDEA TO THE MARKET

THE CYCLE OF IDEAS

SCIPEDIA

Register for free at <https://www.scipedia.com> to download the version without the watermark



TECHNOLOGY TRANSFER

SCIPEDIA

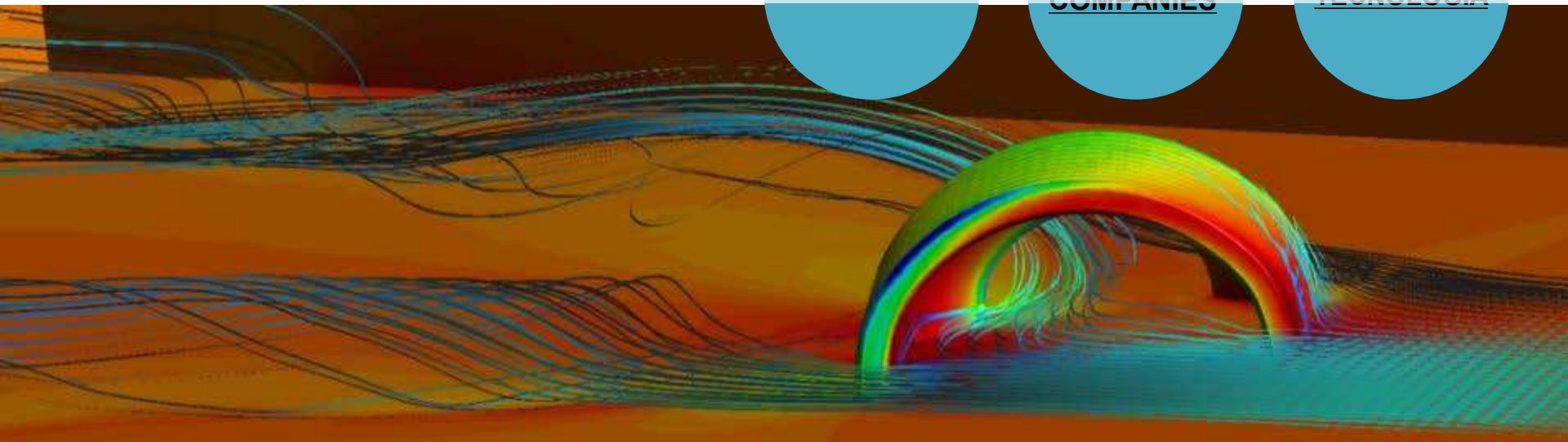
- A vocation for Technology Transfer since 1987.
- Creation of CIMNE Tecnología, SA. (2011), a company 100% owned by CIMNE, in charge of the technology transfer of CIMNE outputs.
- 16 spin-off companies.

Register for free at <https://www.scipedia.com> to download the version without the watermark

PRODUCTS

SPIN-OFF
COMPANIES

CIMNE
TECNOLOGÍA



BEFORE 2011

Created in 2001

SOLUCIONES INTEGRALES DE FORMACIÓN Y GESTIÓN
STRUCTURALIA, SA



E-Training and consulting activities in civil engineering. It was sold in 2011 to The Washington Post Group.

Created in 2002

COMPASS INGENIERÍA Y SISTEMAS, SA



Applications of numerical methods in civil, naval and maritime engineering.
CIMNE owns 24% of COMPASS.

Created in 2006

INGENIA IAE



It promotes the participation of its members in projects of aeronautics and the space field.

It is formed by several companies and CIMNE.

CIMNE
TECNOLOGÍA



Created in 2011, the company is owned by CIMNE aiming to industrialize and market the outputs of CIMNE research.

bd
BIOMECHANICS DEVELOPMENTS, SL

Buildair
Engineering + Architecture
BUILD AIR INGENIERIA Y ARQUITECTURA, SA

Citechsa
COMPUTATIONAL AND INFORMATION TECHNOLOGIES, SA

FWN
FRESH WATER NATURE, SL

HealthApp
HEALTHAPP, SL

Software solutions and services in biomedical field.
50% owned by CIMNE Tecnología.

RSM GASSÓ CIMNE ENERGY, SL

Advanced engineering energy services. 50% owned by Servicios Energéticos Avanzados, which is 100% owned by CIMNE Tecnología.

Inflatable structures for engineering and architecture applications.
5% owned by CIMNE Tecnología.



INLOC ROBOTICS, SL

Positioning and navigation solutions for mobile robots in buried environments.
5% owned by CIMNE Tecnología since 2015.

Computational methods and information technology systems in engineering.
100% owned by CIMNE Tecnología.



LYNCOS TECHNOLOGIES, SL

Software and systems for the Internet of Things.
15% owned by CIMNE Tecnología.

Solutions for obtaining fresh water from desalination and distillation of waste water.
100% owned by CIMNE Tecnología.

PORTABLE MULTIMEDIA SOLUTIONS, SL

Mobile pavilions with multimedia technology for leisure, sport and events.
20% owned by CIMNE Tecnología.

Software to treat eating disorders. It improves the links therapist / patient.
15% owned by CIMNE Tecnología.



PNEUMATIC STRUCTURES TECHNOLOGIES, SL

Pneumatic structures for a wide range of engineering problems.
10% owned by CIMNE Tecnología.

QUANTECH ATZ

Software for production processes. CIMNE Tecnología joined the company in 2015, with a share of 3,5%.

SCIPEDIA
SCIPEDIA, SL

Free publishing and open access for scientific publications.
16,67% owned by CIMNE Tecnología.

TAOC
TECNOLOGÍAS AVANZADAS PARA EL OCIO, SL

Information systems for leisure sectors (tourism, music...).
100% owned by CIMNE Tecnología.



CIMNE tecnología s.a.

Register for free at <https://www.scipedia.com> to download the version without the watermark

CIMNE IN NUMBERS



ACTIVITIES	2016
Postgraduate Studies	4
Conferences	4
Seminars	23
Courses	9
Coffee Talks	11
Publications	118
Books	1
Monographs	15
Research Reports	1
Papers in Journals	101
Spin-off Companies	16
Aulas CIMNE	30
Patents	0 (5)
Contracts with Industry	56 (98)
Competitive Projects	26 (86)
National Projects	13 (40)
International Projects	13 (46)

In brackets, the total number of on-going contracts and RTD projects.

STAFF / POSITION TITLE	2016
Management Staff	3
Administration Staff	39
Research Staff	95
Full Research Professors	29
Associate Research Professors	15
Assistant Research Professors	12
Staff Scientists	7
Post Docs	32
Research Engineers	60
Research Students	95
PhD Students	62
Master Students	30
Ungraduate Students	3
TOTAL Staff	295

Register for free at <https://www.scipedia.com> to download the version without the watermark

About 200 scientists work at CIMNE.

CIMNE IN THE WORLD

SCIPEDIA

Register for free at <https://www.scipedia.com> to download the version without the watermark

30 AULAS CIMNE
in Spain and Latin America

Argentina	●●●●●●	Guatemala	●
Brazil	●●●	Mexico	●●●●
Chile	●	Peru	●
Colombia	●●	Spain	●●●●●●
Cuba	●●	Venezuela	●●●
El Salvador	●		



WE ARE COMPUTATIONAL ENGINEERING /
MECHANICS



Where can I meet my colleagues?

INTERNATIONAL CONFERENCES

CIMNE CONGRESS BUREAU 2017/2018

<http://congress.cimne.com/web/>

ECCOMAS CONFERENCES 2017

 <p>MARINE 2017 VI International Conference on Computational Methods in Marine Engineering</p> <p>14-17 May 2017, Tarragona, Spain</p>	 <p>CM3 - Computation and Big Data in Transport Research in Transport Modelling and Simulation</p> <p>22-24 May 2017, Tarragona, Spain</p>	 <p>SMART 2017 IX ECCOMAS Thematic Conference on Smart Structures and Materials</p> <p>5-8 June 2017, Tarragona, Spain</p>	 <p>COUPLED PROBLEMS 2017 VI International Conference on Coupled Problems in Solids and Engineering</p> <p>12-14 June 2017, Tarragona, Spain</p>	 <p>ADMOS 2017 International Conference on Adaptive Modeling and Simulation</p> <p>26-28 June 2017, Tarragona, Spain</p>	 <p>COMPLAS 2017 XIV International Conference on Computational Plasticity: Fundamentals and Applications</p> <p>5-7 Sept. 2017, Tarragona, Spain</p>	 <p>IGA 2017 V International Conference on Inverse Geometric Analysis</p> <p>11-13 Sept. 2017, Tarragona, Spain</p>	 <p>PARTICLES 2017 VI International Conference on Particle-based Methods: Fundamentals and Applications</p> <p>26-28 Sept. 2017, Tarragona, Spain</p>	 <p>STRUCTURAL MEMBRANES 2017 XIV International Conference on Thermo-Composites and Inflatable Structures</p> <p>9-11 Oct. 2017, Tarragona, Spain</p>
<p><u>MARINE</u> 14/17 May 2017</p>	<p><u>CM3</u> 22/24 May 2017</p>	<p><u>SMART</u> 5/8 June 2017</p>	<p><u>COUPLED PROBLEMS</u> 12/14 June 2017</p>	<p><u>ADMOS</u> 26/28 June 2017</p>	<p><u>COMPLAS</u> 5/7 Sept. 2017</p>	<p><u>IGA</u> 11/13 Sept. 2017</p>	<p><u>PARTICLES</u> 26/28 Sept. 2017</p>	<p><u>STRUCTURAL MEMBRANES</u> 9/11 Oct. 2017</p>

OTHER INTERNATIONAL CONFERENCES AND WORKSHOPS



How can we make our discipline strong?



Sociedad Española de Métodos Numéricos en Ingeniería

CIMNE holds the General Secretariat of the Spanish Association for Numerical Methods in Engineering.



International Association For Computational Mechanics

CIMNE holds the General Secretariat of the International Association for Computational Mechanics.



European Community on Computational Methods in Applied Sciences

CIMNE holds the Secretariat of the European Community on Computational Methods in Applied Sciences.



European Research Community On Flow, Turbulence And Combustion

CIMNE is a Pilot Centre for the European Research Community in Flow, Turbulence and Combustion. ERCOFTAC Spanish Pilot Centre.



International Association of CIMNE Classrooms

The International Association of CIMNE Classrooms is a non-governmental civil non-profit organization which aims to promote the advancement of numerical methods in a common academic space.

Where can I publish my research?

BOOKS, JOURNALS, MONOGRAPHS, SCIENTIFIC REPORTS AND
EDUCATIONAL SOFTWARE ,

CIMNE, with a long tradition as a book publisher, goes one step further in its quest for scientific outreach and has launched its own bookstore. From [CIMNE bookstore](#) it can be purchased books, monographs, scientific reports and educational software on the theory and applications of numerical methods in engineering and applied sciences.



Archives of Computational
Methods in Engineering



Revista Internacional
Métodos Numéricos para
Cálculo y Diseño en
Ingeniería

How our codes / solvers can have a higher impact?



<http://www.cimne.com/kratos/>

Open Source, Parallel, Multi-physics, CFD, Thermal problems, Structural dynamics, Flexibility, Particle Problems, Linear Solvers Libraries...

Visit our GitHub project



HOME
all starts here

ABOUT KRATOS
everything about kratos

CAPABILITIES
all the different stuff

GALLERY
work we are proud of

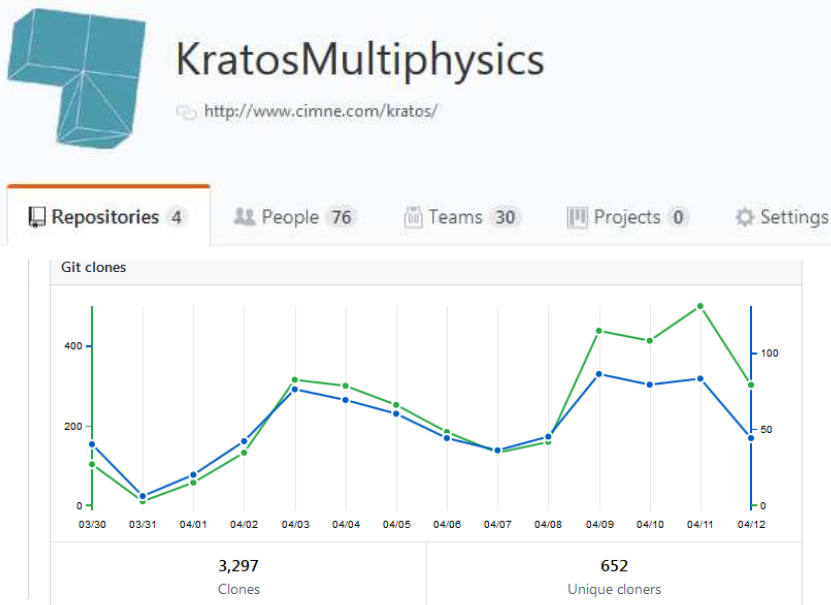


1 Multi-physics
Wide range of finite element applications!

2 Open Source
Freedom and Innovation

3 Parallel HPC
Solve big problems!

4 Flexibility
Industrial or academic applications



How can we make all our knowledge available to the world?

OUR OPEN SCIENCE PLATFORM



Your Open Science and
Research Publishing Platform





Scipedia is an innovative Open Science platform that essentially integrates an advanced online publishing and data management platform with a collaborative social network for researchers and scientific institutions

<https://www.scipedia.com>

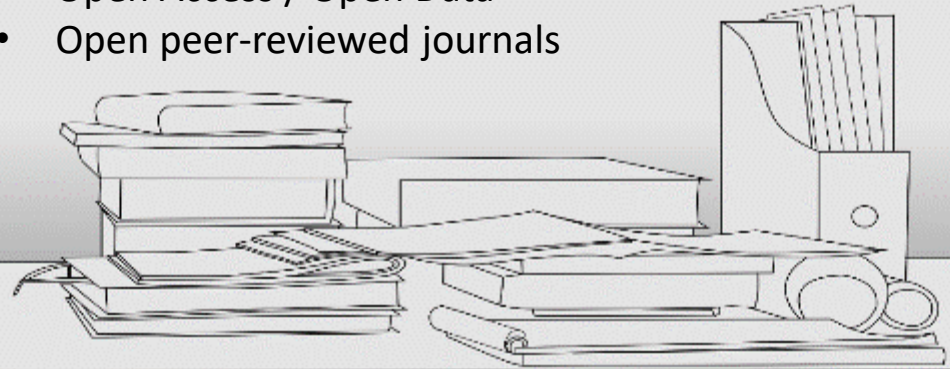
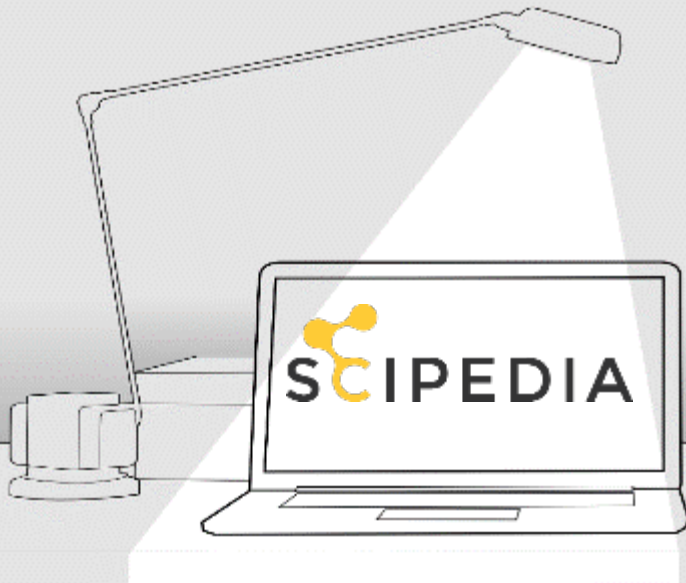
What can Scipedia offer ...

... to researchers?

... to Open Access journals?

... to institutions?

- Personal / project / community profile
- Thematic / personal / project repositories
- Enriched web publishing
- Online collaborative edition
- Discussion forums / groups
- Open Access / Open Data
- Open peer-reviewed journals



What can Scipedia offer to researchers?

The screenshot shows a web browser window displaying the Scipedia profile of Eugenio Oñate. The browser's address bar shows the URL <https://www.scipedia.com/profile/oonate>. The Scipedia navigation bar includes links for Profile, Library, My network, Groups, and Help. The profile header shows the user's name, a profile picture, and a 'CREATE A DOCUMENT' button. Below the header, a horizontal menu highlights 'Activity', 'Profile', 'My publications', 'Experience', and 'Analytics'. The main content area is divided into several sections: a 'SEND A MESSAGE' box with a text input and a 'POST' button; a 'PROFILE STRENGTH' indicator showing 89%; a 'YOUR PROFILE IS COMPLETED' message with a green checkmark; an 'INFORMATION' section with links like 'Submit your paper' and 'Become a publication editor'; and a 'COLLEAGUES' section with an 'INVITE COLLEAGUES' button and a list of colleagues following the user, including Mariano Padilla and Eugenio Muttio. The 'My publications' section is also visible, showing a list of documents published by the user.

- **Personal profile**
 - Overview
 - Publications
 - Experience, skills
 - Google Scholar link
- **Activity panel and messaging tools**
 - Public
 - Followers
 - Groups
- **Personal repositories**
- **Analytics**

What can Scipedia offer to researchers?

The screenshot shows the Scipedia website interface. At the top, the browser address bar displays the URL <https://www.scipedia.org/user/eonate>. The website header includes the Scipedia logo and navigation links: Profile, Library, My network, Groups, and Help. A search bar is located on the right. The main content area features a banner for 'Eugenio Oñate's Research Reports' with a description: 'Eugenio Oñate's Research Reports is an online archive aimed at collecting, preserving, and disseminating digital copies of the research reports written by prof Eugenio Oñate.' To the right of the banner is a statistics table:

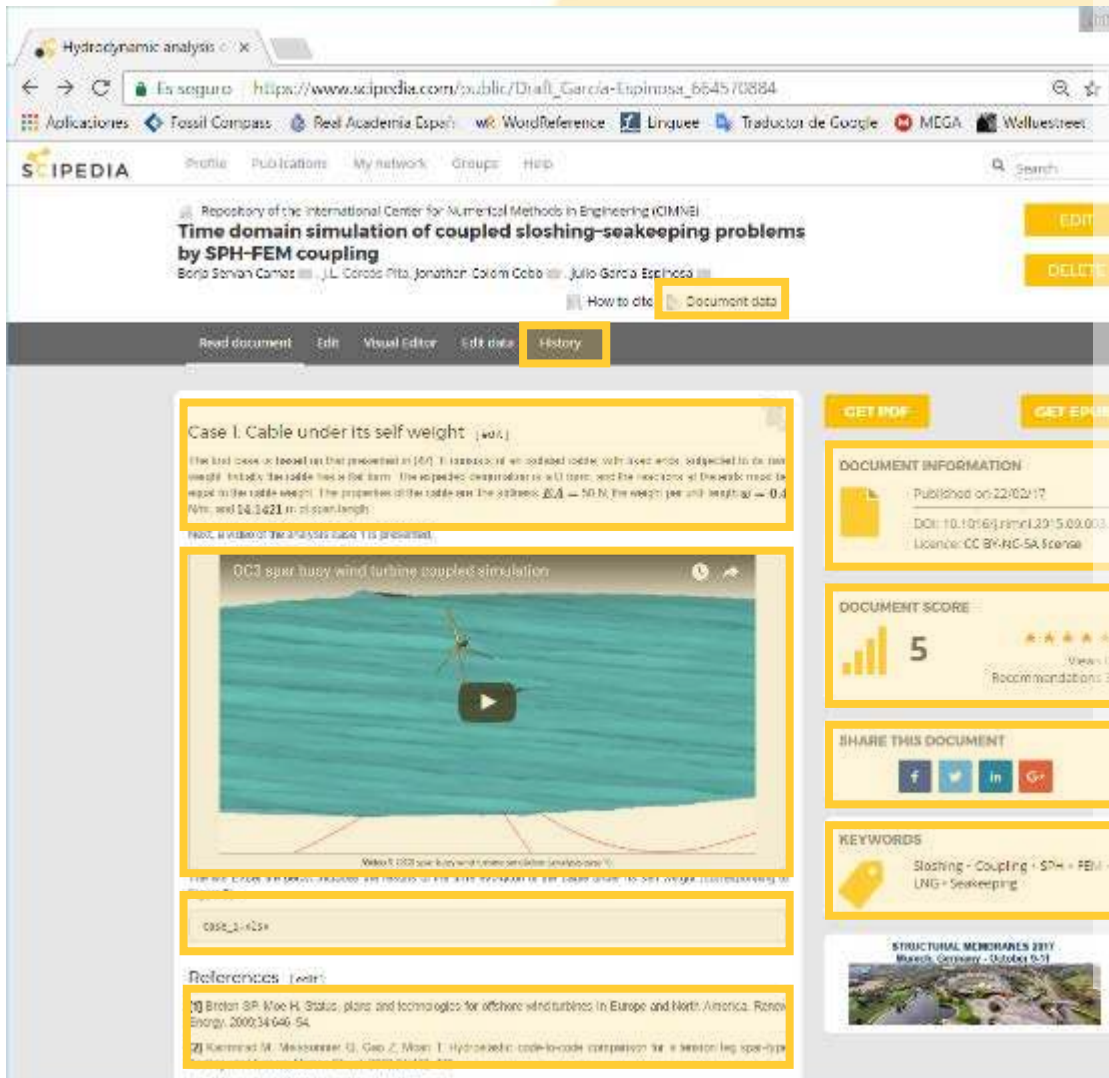
DOCUMENTS	58
VIEWS	1568
SCORE	5
SCORE PERCENTILE	100

Below the banner is a search bar with the text 'Search' and dropdown menus for 'All dates' and 'Featured'. The main content area displays a list of publications. The first publication is titled 'Advances in the DEM and coupled DEM and FEM techniques in non linear solid mechanics', published on 01/01/17, by Eugenio Oñate, F. Zarate, M.A. Celligueta, J.M. González, J. Miquel, J.M. Carbonell, F. Arrufat, S. Latonne, M. Santasusana. The abstract states: 'In this chapter we present recent advances in the Discrete Element Method (DEM) and in the coupling of the DEM with the Finite Element Method (FEM) for solving a variety of problems in non linear solid mechanics involving damage, plasticity and multifracture situations.' The second publication is titled 'Unified Updated Lagrangian Formulation for the Analysis of Quasi and Fully Incompressible Fluids and Solids and their Interaction via a Partitioned Scheme and the PFEM', published on 01/01/14. On the right side of the page, there is a sidebar with sections: EDITORS (Eugenio Oñate, 79 International Centre for Numerical), INFORMATION (About this publication, How to submit, Open access, Contact), and a banner for 'PLATFORM FOR AIRCRAFT DRAG REDUCTION INNOVATION'.

- **Personal / thematic repositories for self-archiving:**
 - Papers (preprints, ...)
 - Research reports
 - Monographs
 - ...
- **Customized page**
 - URL
 - Title and banner
 - About and info
 - Statistics
- **Search tools**
- **Indexing support (metadata)**

What can Scipedia offer ...

... to researchers?



- **Enriched web format + online editor:**
 - text, references, links
 - Datasets,
 - video
 - ...
- **Online (collaborative) edition**
- **Linked to authors/inst. profile**
- **Information**
 - Indexing support (metadata)
 - Keywords (tags)
 - Categories
 - DOI and doc. info
 - Licence
- **Other utilities:**
 - Export to PDF and EPUB
 - Discussion forum
 - Revisions history
 - Share this document
 - Document score
 - Views / recommend.

What can Scipedia offer to researchers?

Every document has a
discussion forum (for authors
and registered users)

The collage illustrates the Scipedia platform's capabilities for researchers. It includes several screenshots:

- Document Listing:** A screenshot of a document titled "A computational model for the evaluation of the spray generation of a Wave Adaptive Modular Vessel" by Julio Garcia-Espinosa, Eugenio Oriate, Borja Serván-Camas, P. Nadukandi, and PA Becker. It shows the document's title, authors, and a brief description.
- Discussion Forum:** A screenshot of a discussion forum for the same document, showing a post by Prof. Sergio Idelsohn from the International Centre for Numerical Methods in Engineering (ICNME).
- Document Content:** A screenshot of the document's abstract, discussing the macroscopic mechanical behavior of crystalline materials and the application of a Lagrangian method based on particle streamlines.
- Presentation Recording:** A screenshot of a presentation recording titled "Computational Crystal Plasticity for the D... Crystal Scale Model" by Antoinette M. Mariatty, showing a video player and a slide with mathematical equations.
- Document Score and Keywords:** A screenshot showing the document's score (0) and keywords: "Swimming", "Spray", "Thermal dynamics", "ANM", "Borja Serván-Camas", "Lagrangian", "Numerical Methods".
- Share This Document:** A screenshot showing social media sharing options (Facebook, Twitter, LinkedIn, Google+).
- Claim Authorship:** A screenshot showing a button to "CLAIM AUTHORSHIP" and a link to "BECOME A SPONSOR OF SCIPEDIA".

ARCHIVE ALL YOUR WORK
(presentations, conference or
seminar videos, data, ...)

A few examples of capabilities

1. EMBEDDED VIDEO:

https://www.scipedia.com/public/Garc%C3%ADa-Espinosa_et_al_2016a

2. EMBEDDED VIDEO & EXCEL data:

https://www.scipedia.com/public/Guti%C3%A9rrez_Romero_et_al_2017a

3. COLLECTION of VIDEOS of presentations from a conference (Complas XIII)

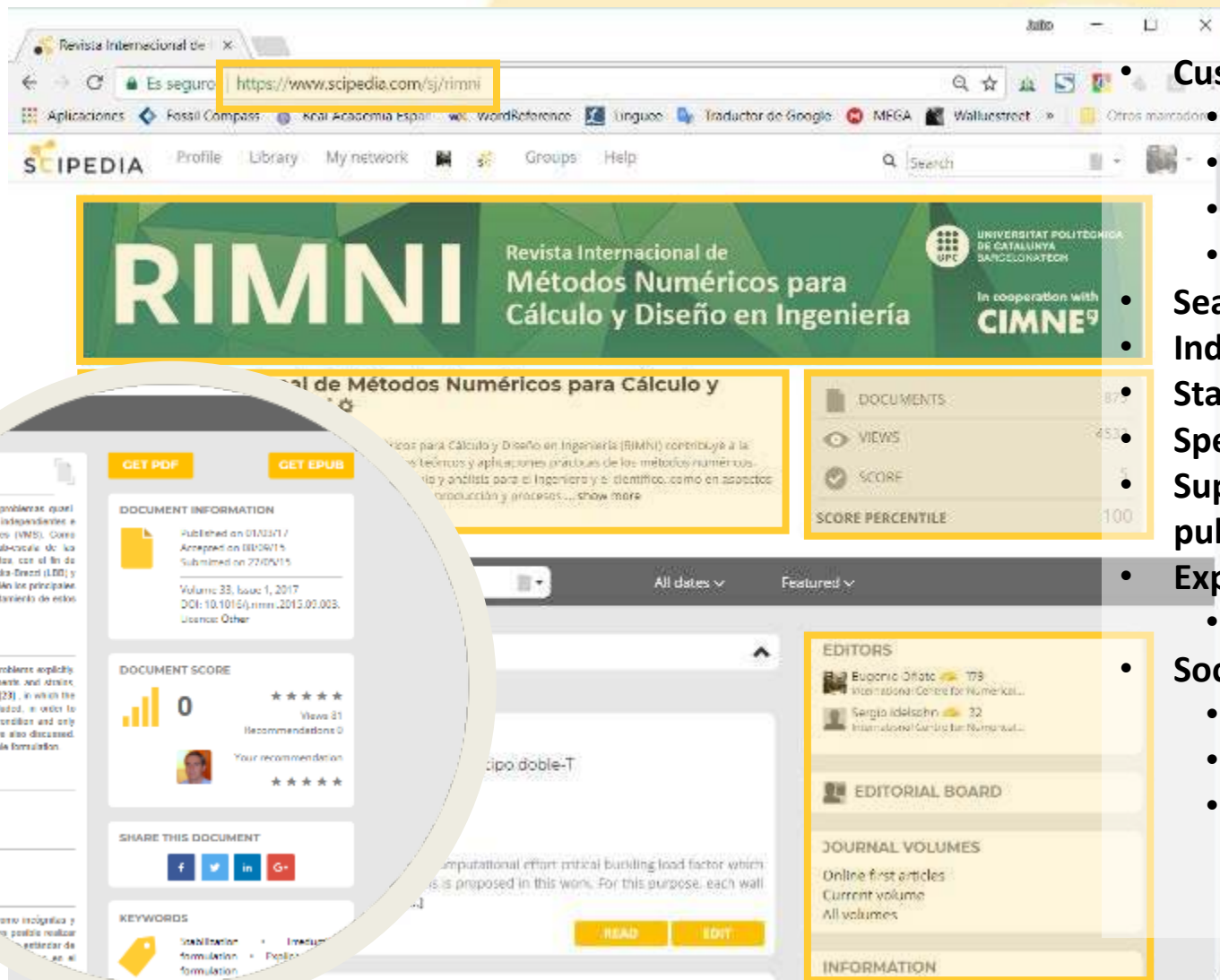
<https://www.scipedia.com/sj/complaxiii>

4. INCLUDES PPT, PDF and Prezi Presentations

<https://www.scipedia.com/sj/jgecp>

What can Scipedia offer ...

... to Open Access journals?



• Customized homepage

URL

- Title, banner, about
- Journal / authors info
- ...

• Search tools

• Indexing support (metadata)

• Statistics (altmetrics)

• Specialized editorial support

• Supports enriched web publishing

• Export tools

- pdf and epub

• Social network tools

- Share document
- Discussion page
- Recommendations

What can Scipedia offer ...

... to Open Access journals?



Enriched web scientific publishing

- Upload your manuscript created in LaTeX, Word or Google Docs using Scipedia import tools.
- Use Scipedia's online (collaborative) editor to improve its content and to insert supplementary material such as video, datasets, models and more.

Advanced journal (and congress) management platform

- Allows editors to handle all aspects of publication.
- Offers advanced support for blind peer-review and collaborative open peer-review (interactive).
- Reduces to the minimum the editorial effort, thanks to our self-publishing and automation services.



What can Scipedia offer ...

... to institutions?

The screenshot shows a web browser window with the URL <https://www.cimne.com/openscience> in the address bar. The browser's toolbar includes various search engines and utility icons. The website header features the CIMNE logo and navigation links: Profile, Library, My network, Groups, and Help. A search bar is also present. The main content area is titled 'International Centre for Numerical Methods in Engineering - Barcelona (Spain)'. Below this, there is a navigation menu with 'Overview', 'Contributions', 'Members', and 'Analytics'. The 'Overview' section is active, displaying a large image of the CIMNE building. To the right of the image, there is an 'INFORMATION' section with details about the address, head of institution, and website. Below this is a 'MEMBERS' section showing a grid of member profiles. At the bottom, there is an 'ANALYTICS' section with a table showing reputation score, contributions, and views.

International Centre for Numerical Methods in Engineering - Barcelona (Spain)

Overview Contributions Members Analytics

INFORMATION

Address
Campus Nord UPC, CIMNE Building C1, C/ Gran Capità, S/N 08034 Barcelona, Spain

Head of institution
 Oñate, Eugenio 253
International Centre for Numerical...

Website
<http://www.cimne.com/>

MEMBERS

ANALYTICS

Reputation score		8396
Contributions		982
Views		9852

Institutional profile

- Customized layout / design
- Dedicated instance (institutional URL)
- Home page
 - Overview
 - Information
- Linked to repositories
 - Institutional
 - Departments
 - Personal
- Directory (members)
- Analytics
- Curation (edition)

What can Scipedia offer ...

... to institutions?

The screenshot shows a web browser window with the URL <https://www.scipedia.com/institution/cimne.upc.edu/section=publications>. The page displays the profile of the International Centre for Numerical Methods in Engineering (CIMNE) in Barcelona, Spain. The 'Contributions' tab is selected, showing three document repositories: 'Papers Repository of the International Centre for Numerical Methods in Engineering (CIMNE)', 'Technical Reports of the International Centre for Numerical Methods in Engineering (CIMNE)', and 'Presentations to the VI International Conference on Coupled Problems in Science and Engineering'. Each repository has a 'Scope' description, statistics (papers, views, ratings), and a 'READ' button. The right sidebar contains 'INFORMATION' (Address, Head of institution, Website) and 'MEMBERS' (a grid of member avatars). At the bottom, an 'ANALYTICS' section shows a Reputation score of 6561, 1005 Contributions, and 8849 Views.

- **Document/Data repositories**

- Preprints / open access papers
- Research / Project reports
- Monographs
- Proceedings / presentations
- Open data repositories

- ...
- **Links to selected archives**

- Institutional
- Departments / groups
- Personal

- **Journals**

- **Multiple links to documents**

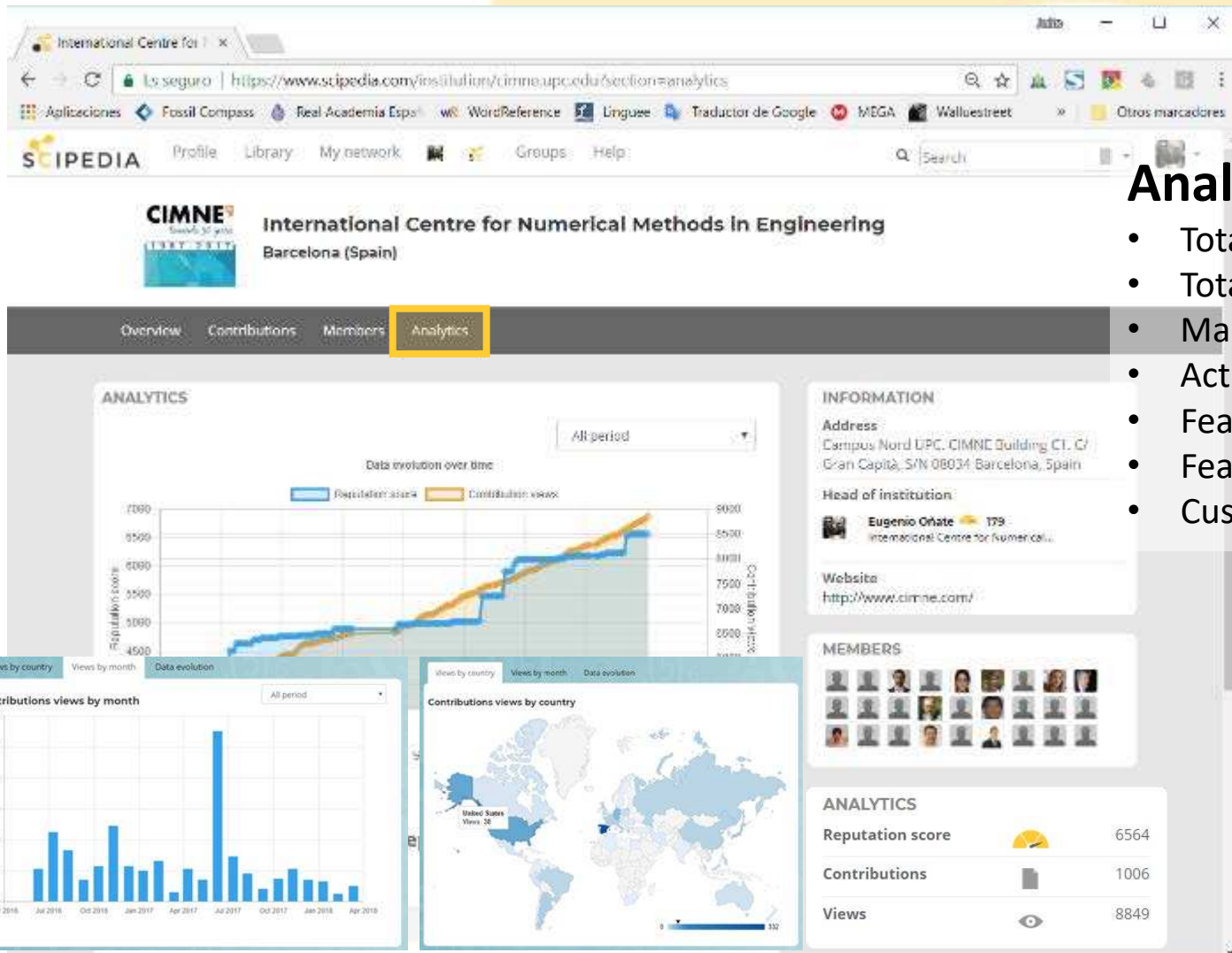
What can Scipedia offer to institutions?

Data / Big data repositories

The screenshot shows a Scipedia document page. The browser address bar displays the URL: https://www.scipedia.com/public/Draft_García-Ispinosa_6645/0001. The page title is 'Software Quality Assessment Tool Based on Meta-Models' by Julio García Espinosa. The document is a ZIP file named 'HeatMapWrapper-0.13_release.zip'. The 'Description' section states: 'The described software tool allows the definition of software quality models, based on dependencies, and iterative forwarding of test cases between a base of software quality models and accessible software quality models.' The 'Document Information' section shows the DOI: 10.1015/rim.2010.00.003 and the license: CC BY-NC-SA license. The 'Document Score' is 5. The 'Share this document' section includes social media icons for Facebook, Twitter, LinkedIn, and Google+. The 'Keywords' section lists: 'Slicing - Coupling - SPH - FEM - 1. Nk - 1. Nk - 1. Nk'. The 'References' section lists two references: 1) Author, A. and Author, B. (Year) Title of the article. Title of the Publisher. Article code. Available: <http://www.sciencedirect.com/doi/10.1015/rim.2010.00.003>. 2) Author, A. and Author, B. (Year) Title of the article. Title of the Publisher. Volume number, first page-last page.

- **Description**
- **Structured data (templates)**
 - Datasets, Software, Graphs, Video, Big data sets, ...
 - Preview (when available)
- **Unstructured data**
 - Text + datasets +
+ video + pictures + ...
 - Online edition
- References / external links
- **Metadata (XML)**
- Keywords (tags)
- Licence
- **DOI and document info**
- Other utilities:
 - Discussion forum
 - History
 - Share this document
 - Document score

What can Scipedia offer to institutions?



Analytics

- Total views
- Total contributions
- Map filters
- Activity index (reputation)
- Featured members
- Featured documents
- Customized ...



- **Scipedia Open Science Portal (SOSP)** offers a flexible and reliable **solution for creating/customizing institutional open collaborative platforms**. It includes, among others, the following features: institutional profiles support, interface with institutional CRIS, management system for institutional, personal and community repositories (including big-data), support for profiles of communities or research projects, gamification tools, etc.
- **Scipedia Open Publishing Platform (SOPP)** offers a comprehensive **solution for creating/customizing a corporative/institutional online publishing platform**. It includes, among others, the following features: online journal management system, online edition tools, web publishing tools, import/export tools, basic social network services, management of personal profiles (including Google Scholar link), etc.

<https://www.scipedia.com>



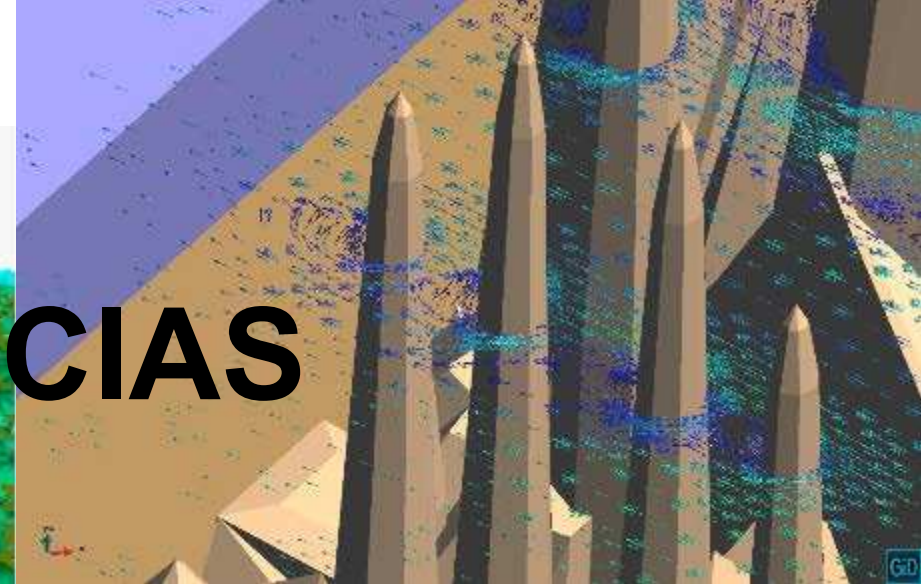
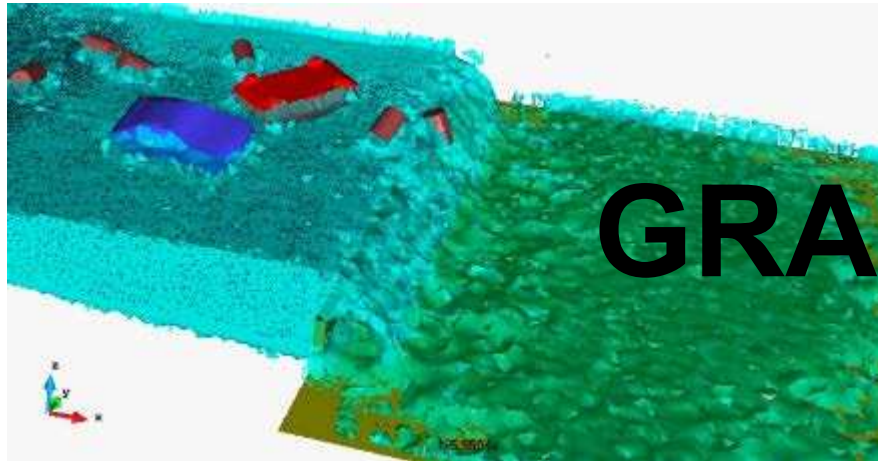
Your Open Science and
Research Publishing Platform

<https://www.scipedia.com>



For any question, you can contact us at:

info@scipedia.com



GRACIAS

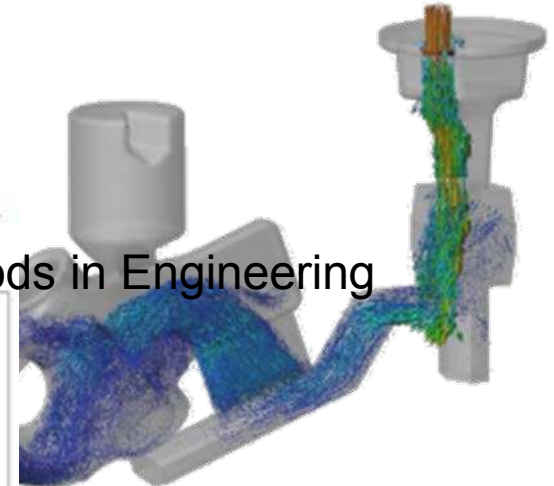
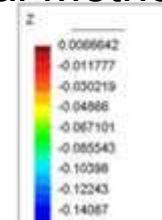
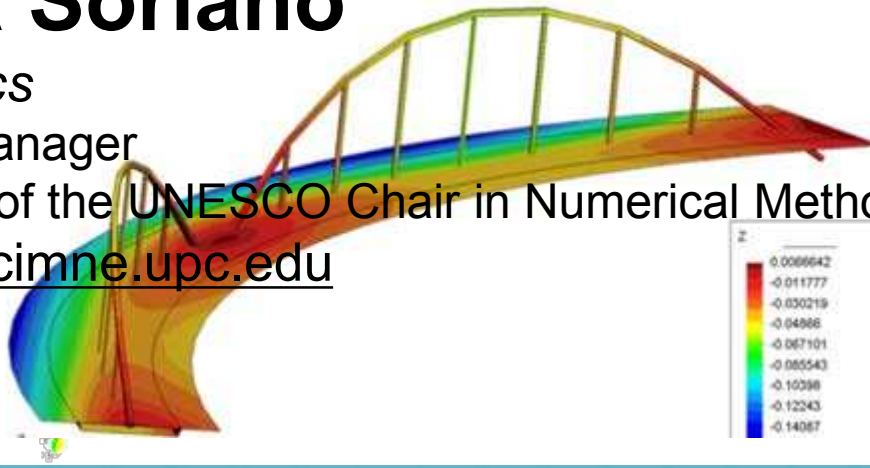
Cecilia Soriano

PhD Physics

Research Manager

Coordinator of the UNESCO Chair in Numerical Methods in Engineering

csoriano@cimne.upc.edu



A Consortium of:



Generalitat
de Catalunya



UNIVERSITAT POLITÈCNICA
DE CATALUNYA
BARCELONATECH

In cooperation with:



International Center for Numerical Methods in Engineering

CIMNE[®]

1 9 8 7 - 2 0 1 7

30 years

**generating
knowledge and solutions**